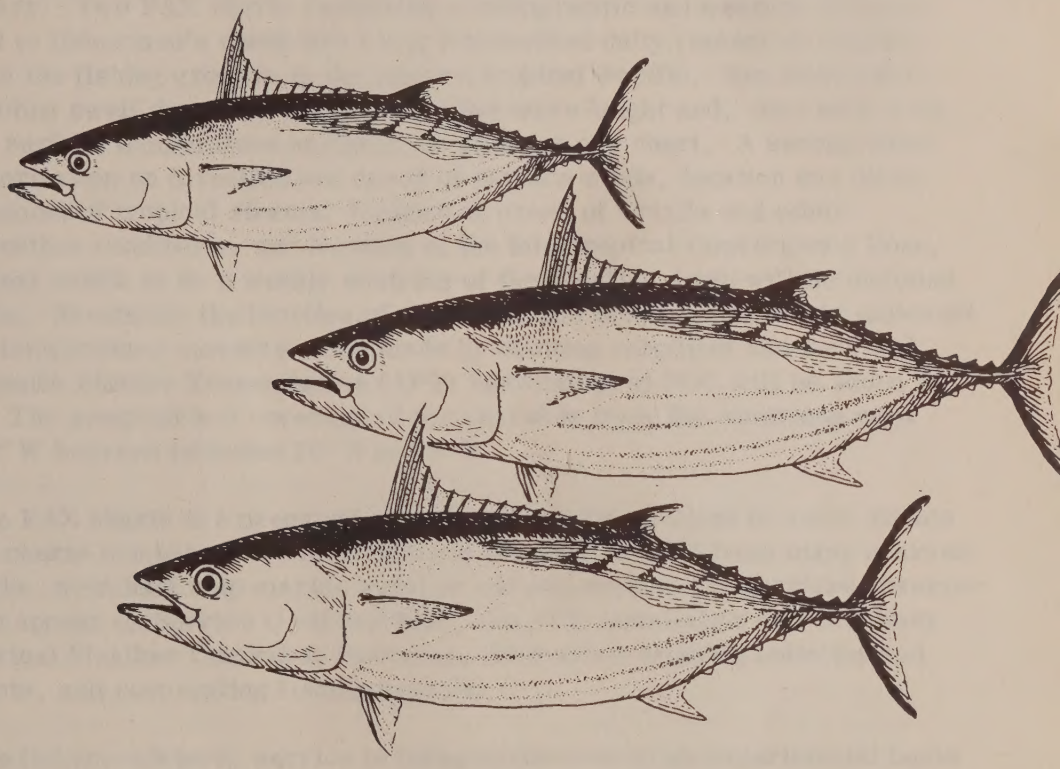
UNITED STATES
PARTMENT OF
OMMERCE
IBLICATION

JANUARY 1971

FISHING INFORMATION

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



NATIONAL
MARINE
FISHERIES
SERVICE

FISHERY-
ANOGRAPHY
CENTER
LA JOLLA,
CALIFORNIA

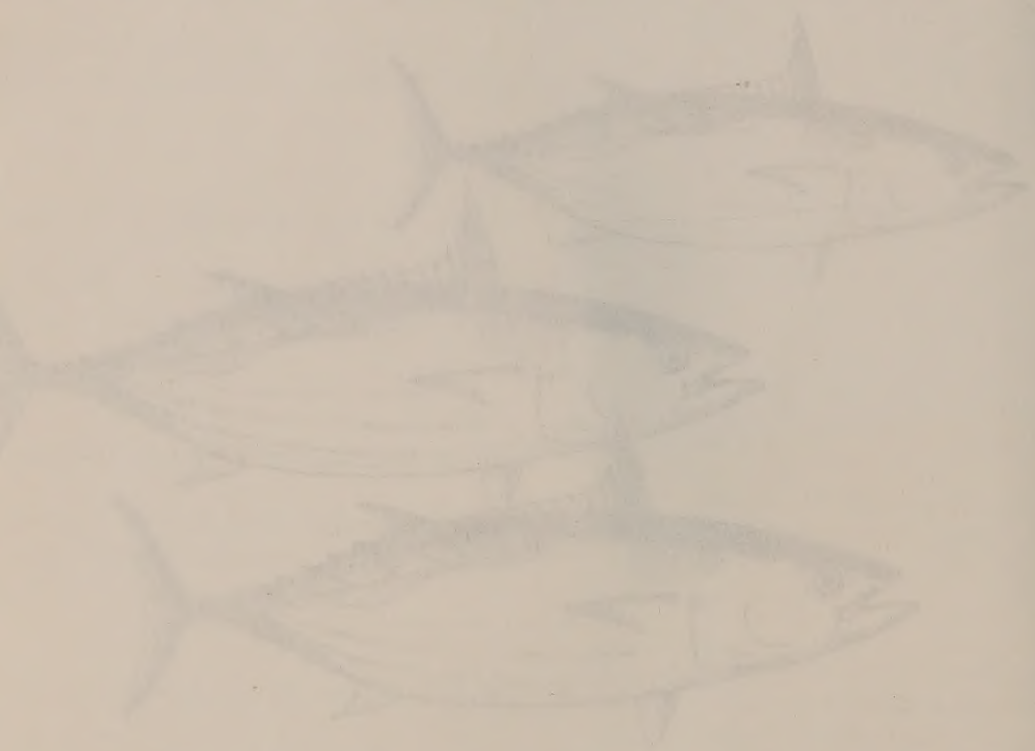
Contents

Page

Fishery-Oceanography Center Fishery-Advisory Service Extended to Tropical Tuna Fleet via Radio Facsimile Broadcast 1

Narrative Description of Ocean Temperature Conditions. 2

Sea Surface Temperature Charts, Pacific Ocean, January 4



FISHERY-OCEANOGRAPHY CENTER FISHERY-ADVISORY SERVICE EXTENDED TO TROPICAL TUNA FLEET VIA RADIO FACSIMILE BROADCAST

The Fishery-Oceanography Center (FOC) fishery-advisory service was extended to the tropical Pacific tuna fleet via radio facsimile (FAX) broadcast during January. Two FAX charts containing oceanographic and weather information tailored to fishermen's needs are being transmitted daily (except weekends) to vessels on the fishing grounds in the eastern tropical Pacific. Sea state information including swell direction and height, wind-wave height and, once each week, a 7-day sea surface temperature analysis, is given on one chart. A second chart provides information on direction and speed of surface winds, location and direction of movement of tropical storms, location of areas of squalls and other inclement weather conditions, and location of the Intertropical Convergence Zone. Within the next month or so a weekly analysis of thermocline depth will be included on the charts. Eventually the location of ocean surface temperature fronts indicated by infrared temperature measurements made by orbiting satellites and received by the Automatic Picture Transmission (APT) installation at FOC will be added to the charts. The geographical coverage of the charts is from the American west coast to 140° W between latitudes 30° N and 5° S.

The FAX charts are prepared at FOC and are transmitted by radio station WWD. The charts are based on data which are received at FOC from many sources. These include: merchant ship marine weather and sea surface temperature observations, which appear on Service O circuit 8275, the APT installation at FOC, Navy Fleet Numerical Weather Central at Monterey, NWS storm warning bulletins and other products, and cooperating fishing vessels.

The fishery-advisory service is being performed on an experimental basis as a means of obtaining valuable environmental data from fishing vessels and to provide fishermen with information which may assist them in making tactical fishing decisions. The environmental data collected by fishermen are necessary for use in the development of fishery-forecasting techniques and methods for tropical tunas now underway at FOC.

FOC is providing a limited number of FAX recording sets to cooperating fishermen with the agreement that fishermen make and transmit ashore at least one XBT-BATHY or synoptic marine weather observation per day while on the fishing grounds. FAX equipment was installed aboard three modern purse seiners prior to their sailing for the start of the 1971 yellowfin season. These vessels have reported very good quality FAX transmissions and that the information has

been of great assistance to them in planning fishing operations. There are reports that the three vessels have in turn passed information contained on the FAX charts to other boats fishing in the area. The three fishing vessels equipped with FAX have cooperated fully in making and radioing ashore environmental data: in the period January 11-31, 66 XBT-BATHY and 5 synoptic marine weather observations have been received. FAX gear will be installed on 10 more vessels when they return from their first fishing trip, and is also being installed at the offices of the American Tunaboat Association and California Westgate Terminal, Inc. These two offices have daily radio contact with boats in the tropical tuna fleet and will pass information as requested.

R. Michael Laurs, Leader
Fishery-Oceanography Program

NARRATIVE DESCRIPTION OF OCEAN TEMPERATURE CONDITIONS

Northeastern Pacific

Seasonal cooling of sea surface temperature in the northeast Pacific usually slackens in January as winter minimum temperatures are approached. In 1971, this tendency was altered selectively by a dislocation of the normal atmospheric pressure pattern which led to reduced cooling in the central ocean area 30°-45° N, 145°-165° W and to an increased rate of cooling in surrounding areas. As a result, the region of large positive temperature deviations from the long term mean shown in Figure 3 has spread eastward in the zone 30°-45° N from its position in December 1970, while the magnitude of maximum deviation in the area west of 170° W has decreased. Furthermore, the areas of negative deviation from the long term mean, northeast, east and south of the warm region, were more extensive in January 1971, than in the previous month.

The significance of large bodies of persistently warm water (such as that in Figure 3) to the Nation's weather patterns was noted in the February 1971 issue of the trade journal "Ocean Industry." A brief article was devoted to the views of Jerome Namias, Chief of the Extended Forecast Division of the National Weather Service and research scientist for the Scripps Institution of Oceanography. He believes that the abnormally warm ocean water causes a shift in the high level, eastward flowing stream of air known as the jet stream, resulting in the movement of warm tropical air into the western states and cold Canadian air into the east.

In turn, as indicated above, we can relate the abnormal pattern of December to January cooling of surface water to atmospheric conditions. In particular, the region of high barometric pressure (known as the subtropical anticyclone) was more intense than normal in January 1971 and was shifted northwest of its mean location (see Figure 8 and Figure 9). Also, the region of low barometric pressure normally over the Aleutian Islands was more intense than usual and shifted southeast of its mean location. Consequently, a strong pressure gradient was established between the high and low pressure systems which produced stronger than normal southerly winds. This circulation pattern retarded cooling of surface water in the area from 30°-45° N and 145°-165° W in two ways: 1) by driving relatively warm southerly water northward through the action of surface wind stress, and 2) through a reduction of heat lost by evaporation which was inhibited by the high moisture content of the southerly winds.

The opposite conditions prevailed west of 165° W and east of 135° W where stronger than normal, relatively dry, northerly winds prevailed, driving cold water southward to increase local cooling and absorbing a greater amount of heat from the ocean for evaporation.

Eastern Tropical Pacific

The sea surface temperatures along the equatorial zone from about 5° S to 10° N warmed as much as 4° F since December 1970, but still remained significantly colder than normal in January 1971 (see Figure 5 and Figure 6). The continuance of this cold condition can be attributed to persistent southeast trade winds blowing 10-15 knots, and to the generally heavy cloud cover south of the Intertropical Convergence Zone. Environmental data received at the end of January indicate that further warming is likely to occur along the equator.

The cold pool of water at about 10° N, 90° W, known as the Costa Rica Dome, was colder than usual in January 1971. Water temperatures in the Gulf of Tehuantepec, which often fluctuate in phase with those in the Costa Rica Dome, were, to the contrary, warmer than normal in January 1971, due to a lower frequency of north winds over the Gulf.

Staff, Fishery-Oceanography Program
R. Michael Laurs, Leader

SEA SURFACE TEMPERATURE CHARTS, PACIFIC OCEAN
JANUARY 1971

Acknowledgements

The following organizations and stations contributed data for the January charts:

General Dynamics Convair Division; Ocean Data Buoy ALPHA
Global Marine Inc.; GLOMAR CHALLENGER
Hopkins Marine Station, Pacific Grove, California, J. P. Balesteri
Inter-American Geodetic Survey by L. Peren at Puerto Armuelles, Panama; D. Chavez at Talara, Peru; G. Castillo at San Juan, Peru
Kelco Company, San Diego, California
Living Marine Resources Inc., San Diego, California
Matson Navigation Company, San Francisco; S.S. CALIFORNIAN
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Biological Laboratories La Jolla, California; Honolulu, Hawaii; Seattle, Washington
National Weather Service, San Diego, California
National Ocean Survey, Pacific Marine Center, Seattle, Washington
Pacific Environment Institute, Fisheries Research Board of Canada, West Vancouver, British Columbia, by H. J. Hollister from observations by D. Smith at Langara Island Light; R. J. Bourque at Cape St. James Light; Lily Collins at Kains Island Lightstation; O. A. Edwards at Amphitrite Point Light
Pacific Missile Range, Range Operations Department, Geophysics Division, Point Mugu, California
Scripps Institution of Oceanography, La Jolla, California, by Margaret Robinson
Scripps Institution of Oceanography Research Vessels ALEXANDER AGASSIZ, MELVILLE, THOMAS WASHINGTON
U.S. Naval Weather Service, Fleet Numerical Weather Central, Monterey, California
Fishing Vessels ANTONINA C., KERRI M., SEA QUEST, WEST POINT

Charts

Figure 1. --Mean sea surface temperature, eastern north Pacific Ocean. Squares show temperatures at weather ship stations. Numerals on shore are temperatures at coastal and lightship stations.

Figure 2. --Mean sea surface temperature chart, western north Pacific Ocean.

Figure 3. --Deviation of sea surface temperatures, eastern north Pacific Ocean from long term charts of H. O. 225. Hatched areas are colder in 1971.

Figure 4. --Deviation of sea surface temperatures, eastern north Pacific Ocean from those of January 1970. Hatched areas are colder in 1971.

Figure 5. --Mean sea surface temperature, eastern tropical Pacific Ocean. Numerals on shore are temperatures at coastal stations.

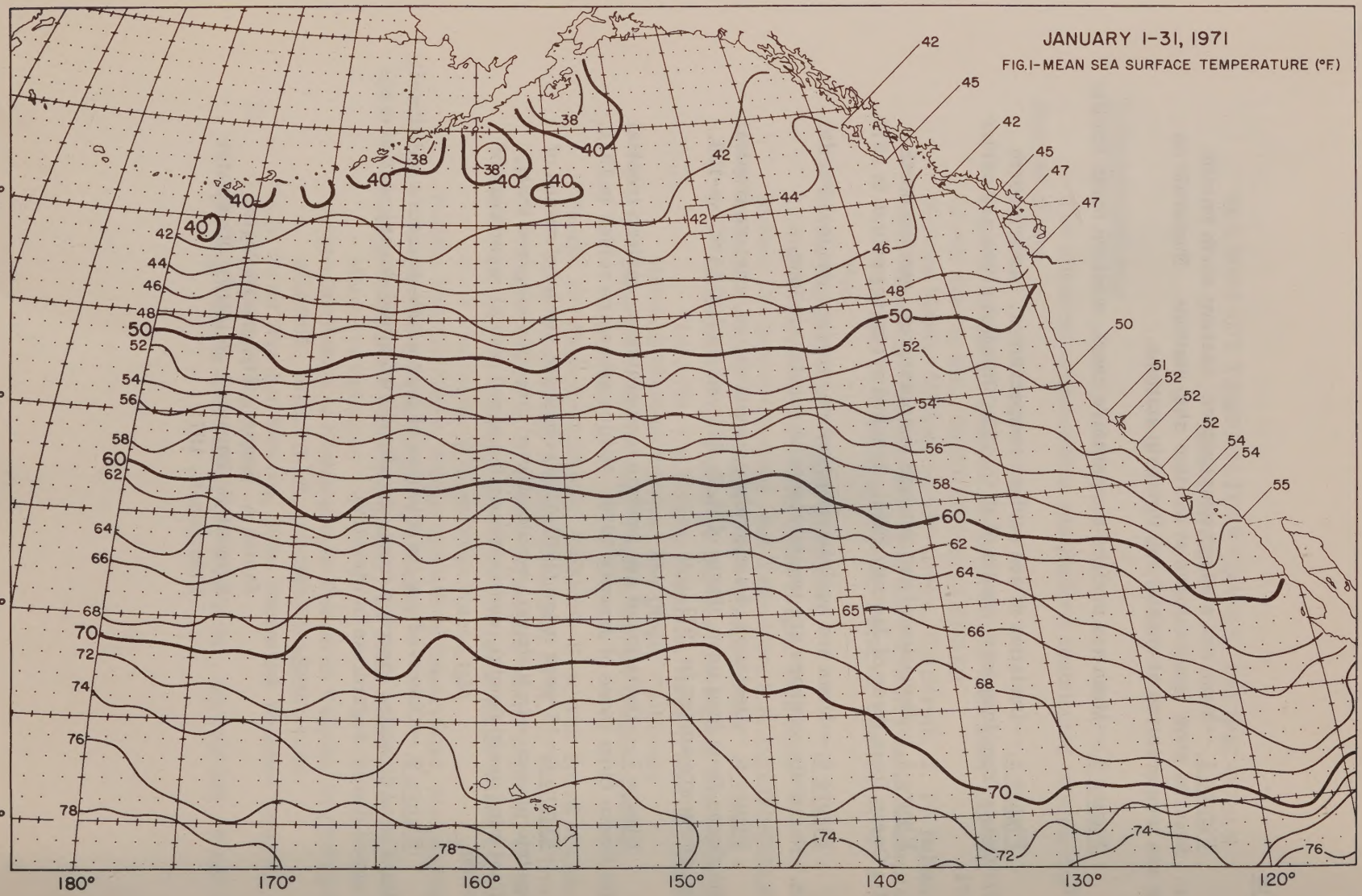
Figure 6. --Deviation of sea surface temperatures, eastern tropical Pacific Ocean from long term charts of H. O. 225 and NAVOCEANO sp-123. Shaded areas are colder in 1971.

Figure 7. --Deviation of sea surface temperatures, eastern tropical Pacific Ocean from those of January 1970. Shaded areas are colder in 1971.

Figure 8--11-year mean (1961-1971) observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots), and average wind speed (knots) regardless of direction.

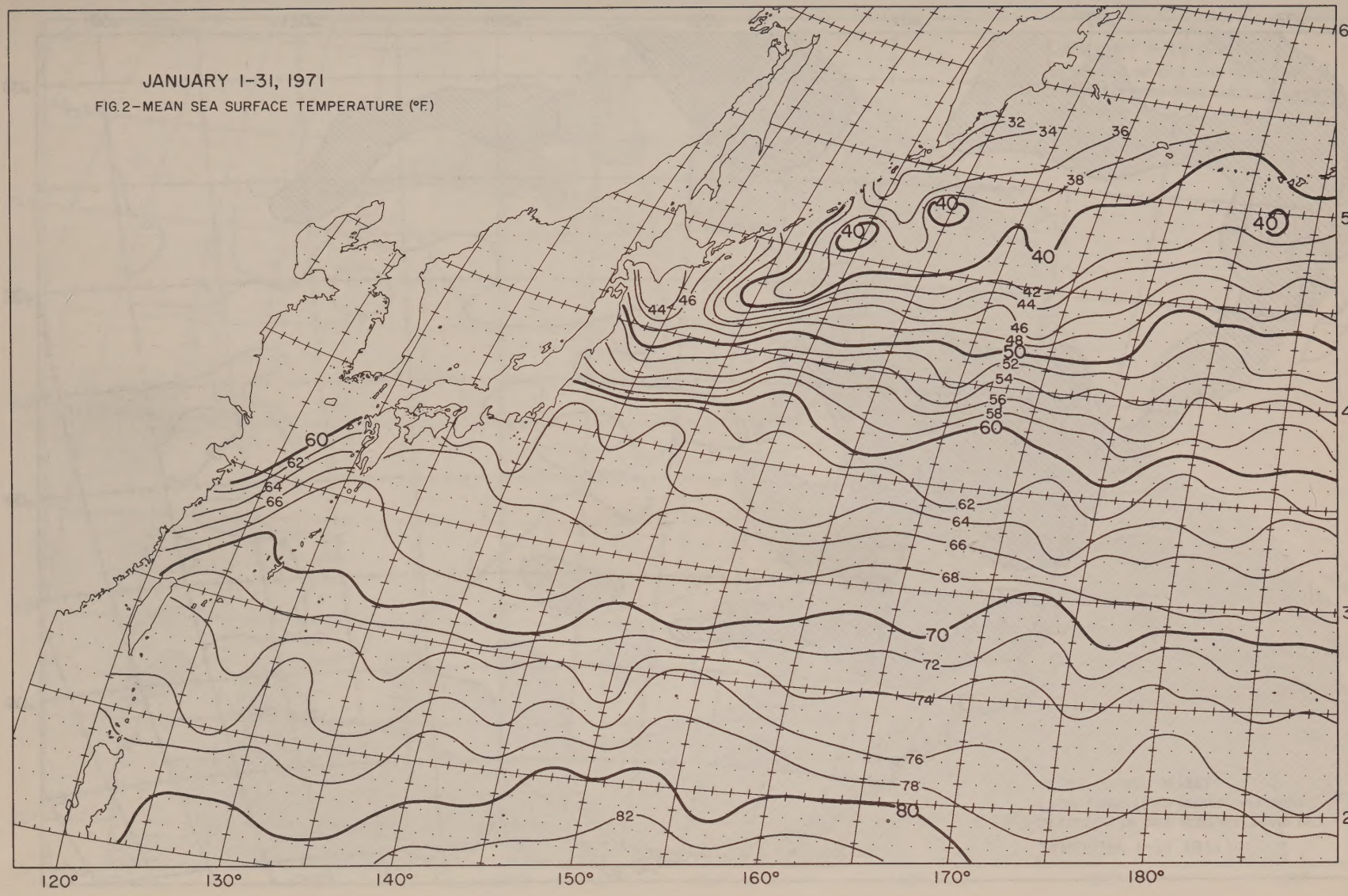
Figure 9. --Observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots), and average wind speed (knots) regardless of direction.

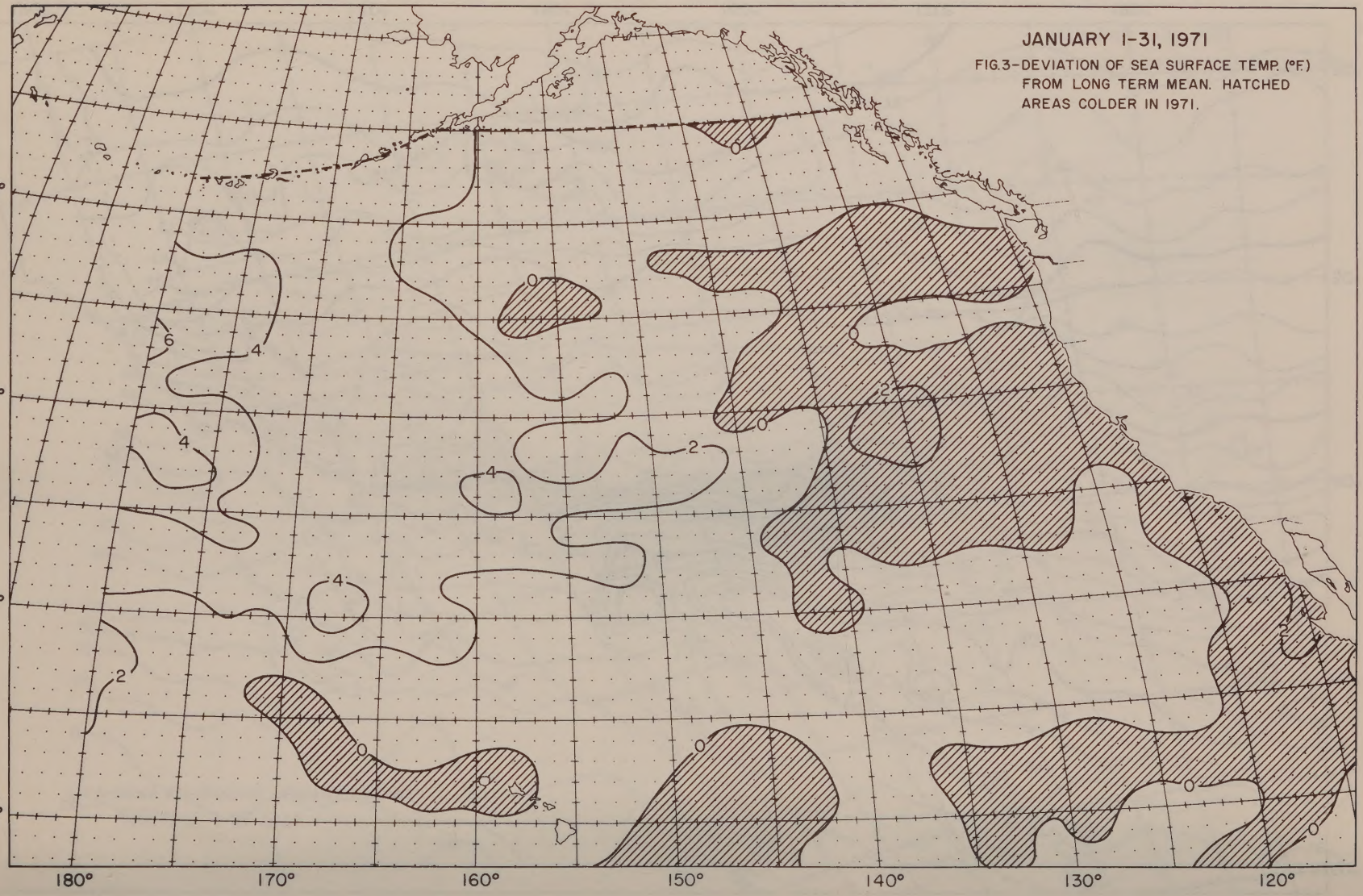
James A. Renner, Fishery Biologist
Kenneth S. Raymond, Scientific Illustrator
February 9, 1971

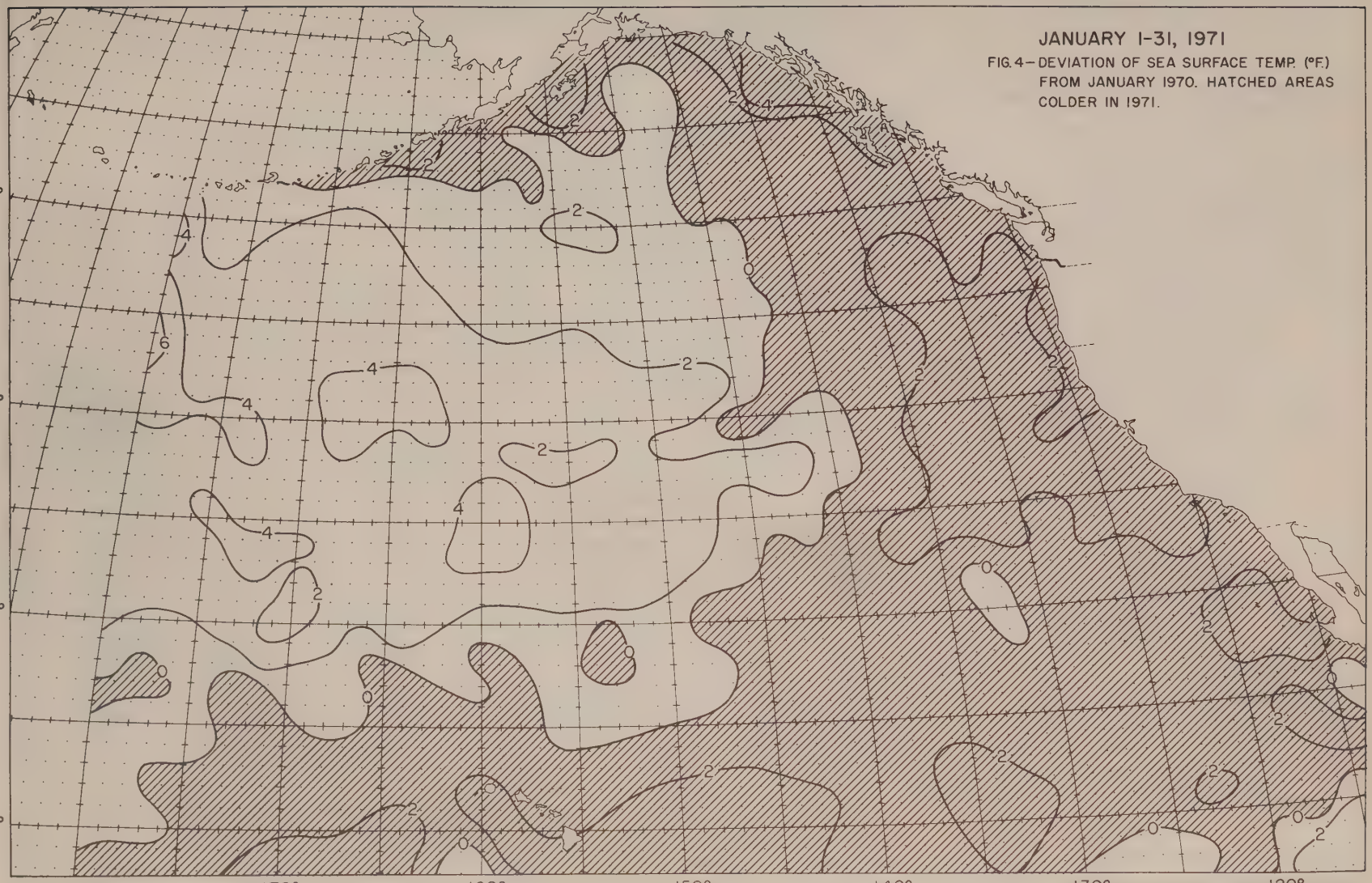

JANUARY 1-31, 1971
FIG.1-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

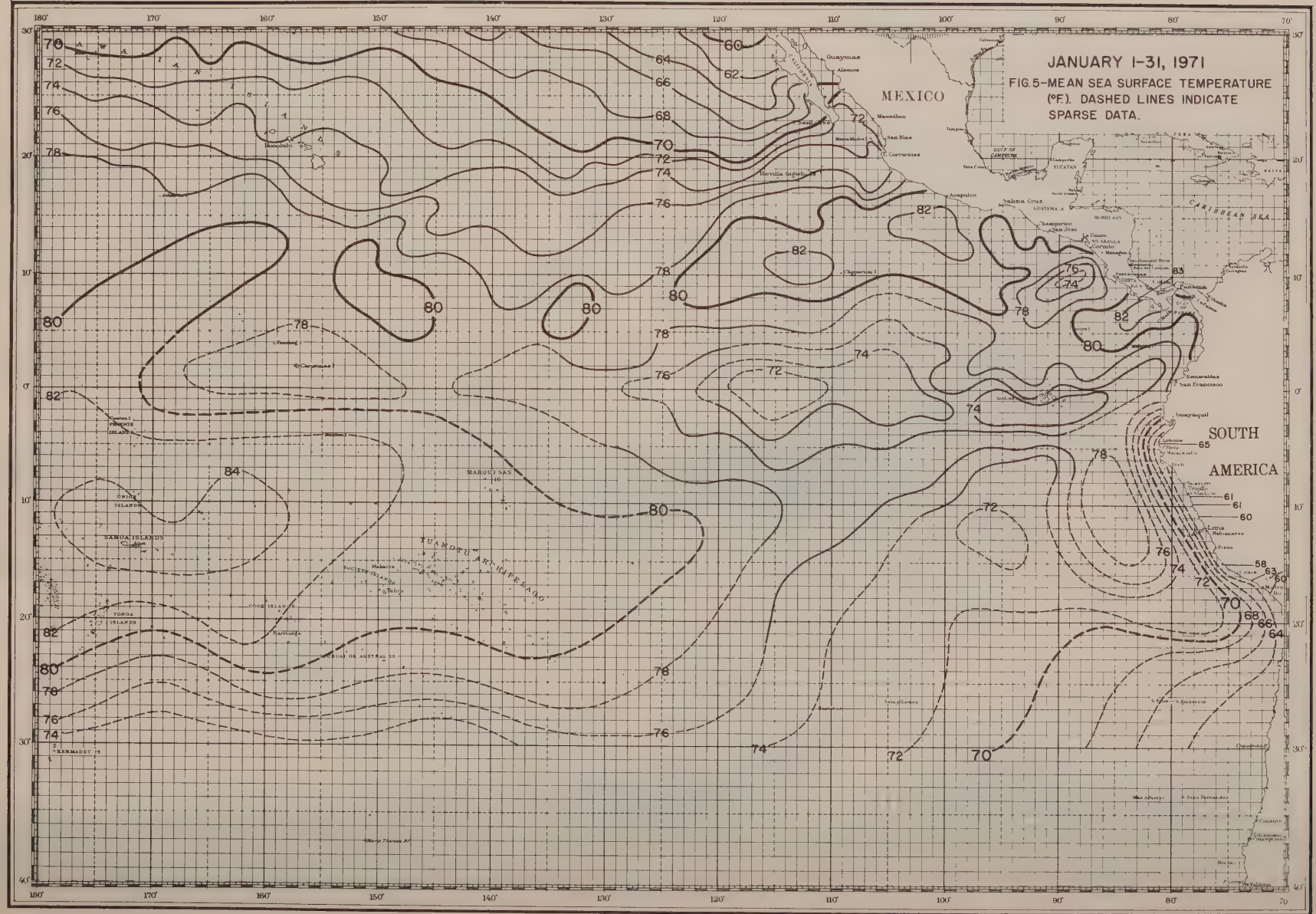
JANUARY 1-31, 1971

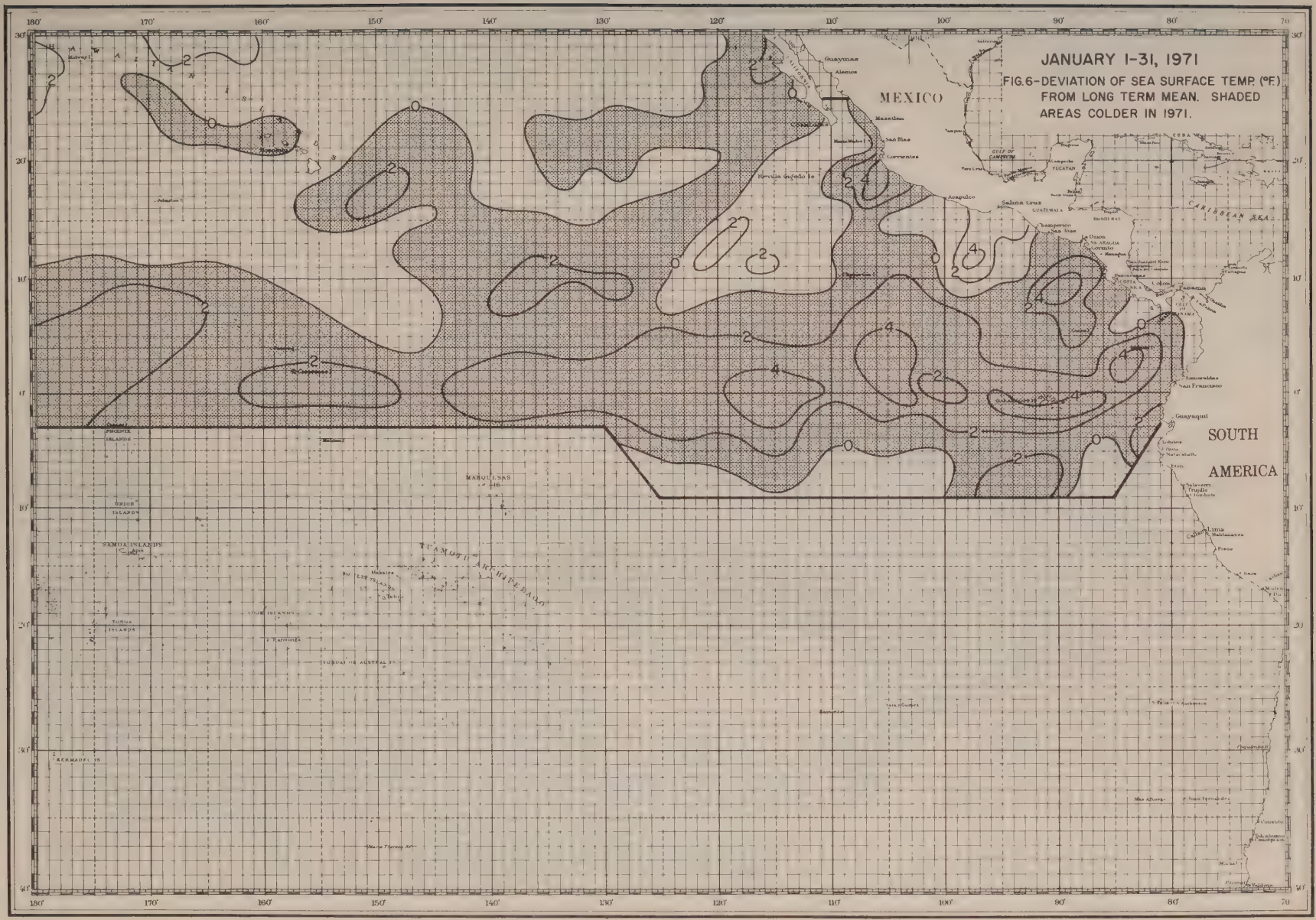
FIG. 2 – MEAN SEA SURFACE TEMPERATURE (°F.)

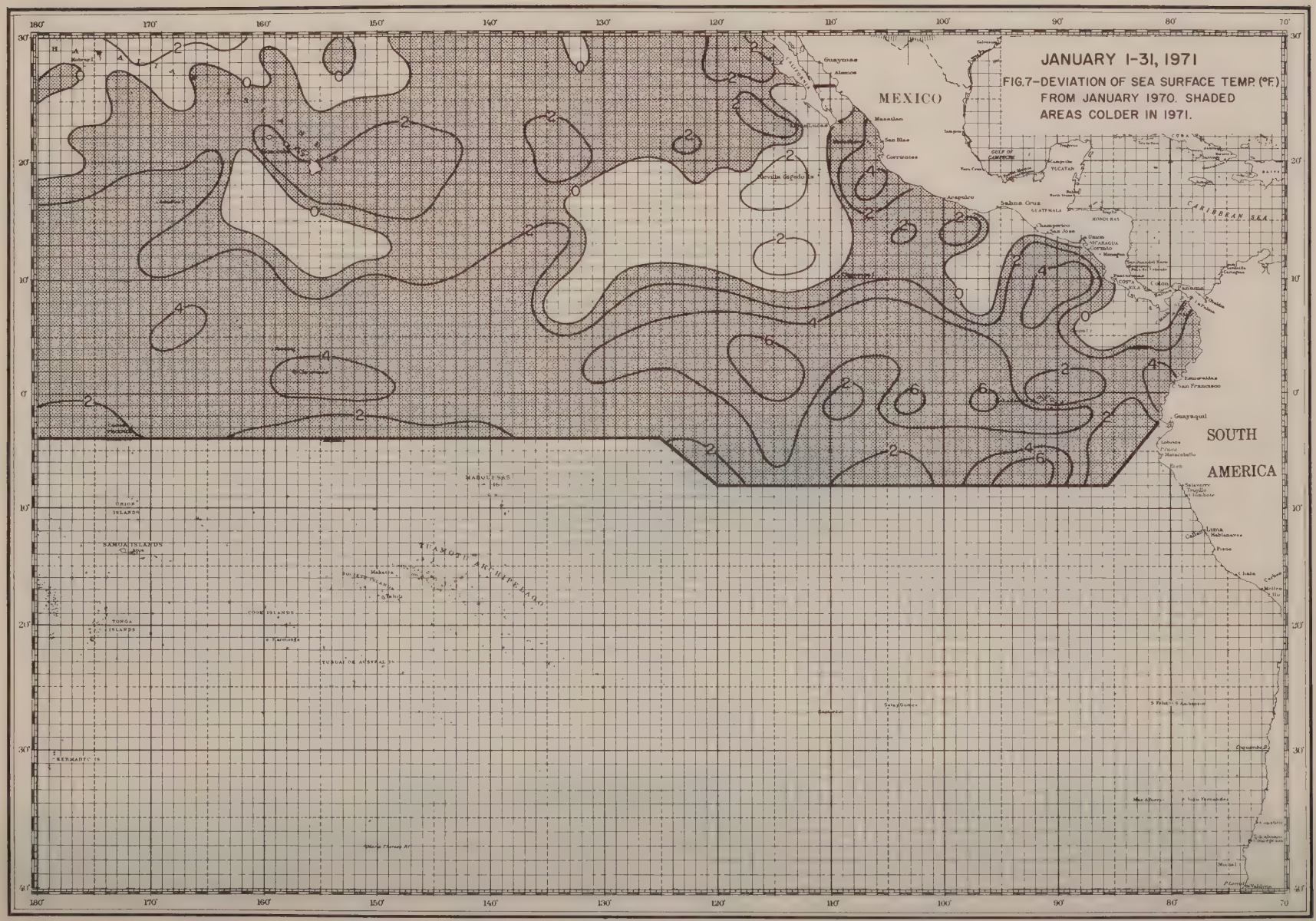


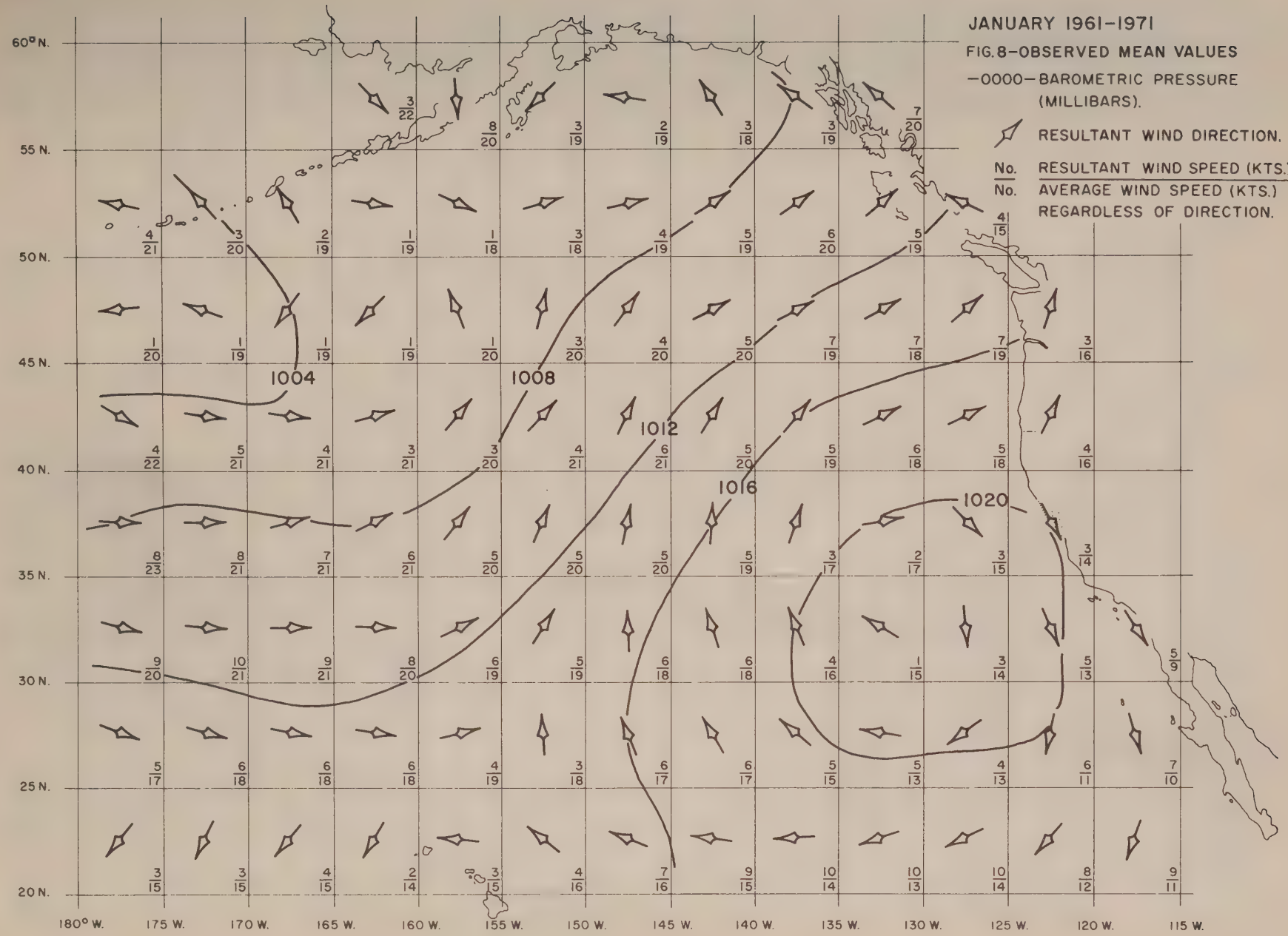

JANUARY 1-31, 1971
FIG.3-DEVIATION OF SEA SURFACE TEMP. (°F.) FROM LONG TERM MEAN. HATCHED AREAS COLDER IN 1971.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
6
4
4
4
4
2
2
0
0
0
0
0
0
0
0
0

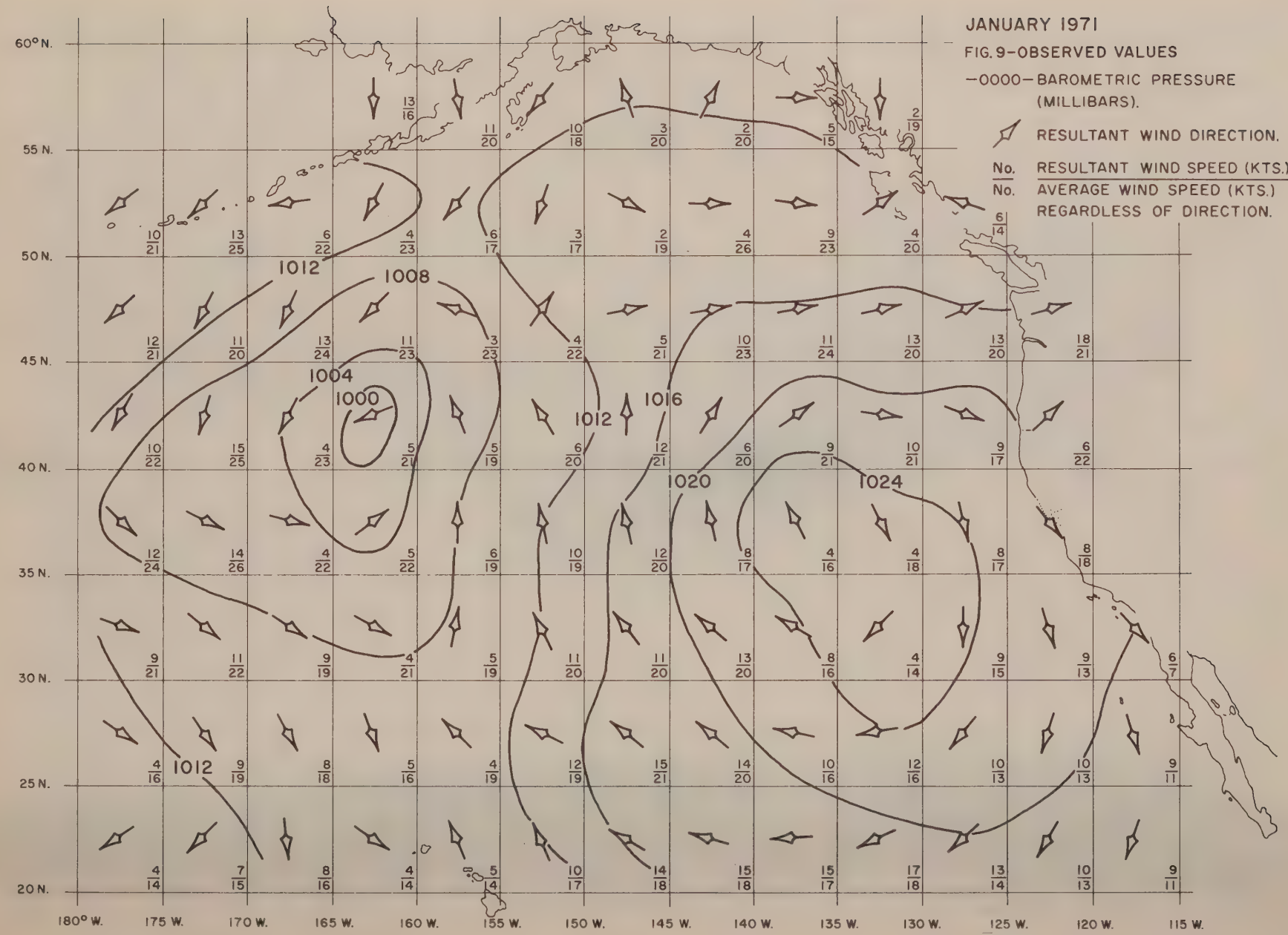

JANUARY 1-31, 1971
FIG. 4 – DEVIATION OF SEA SURFACE TEMP. (°F.) FROM JANUARY 1970. HATCHED AREAS COLDER IN 1971.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

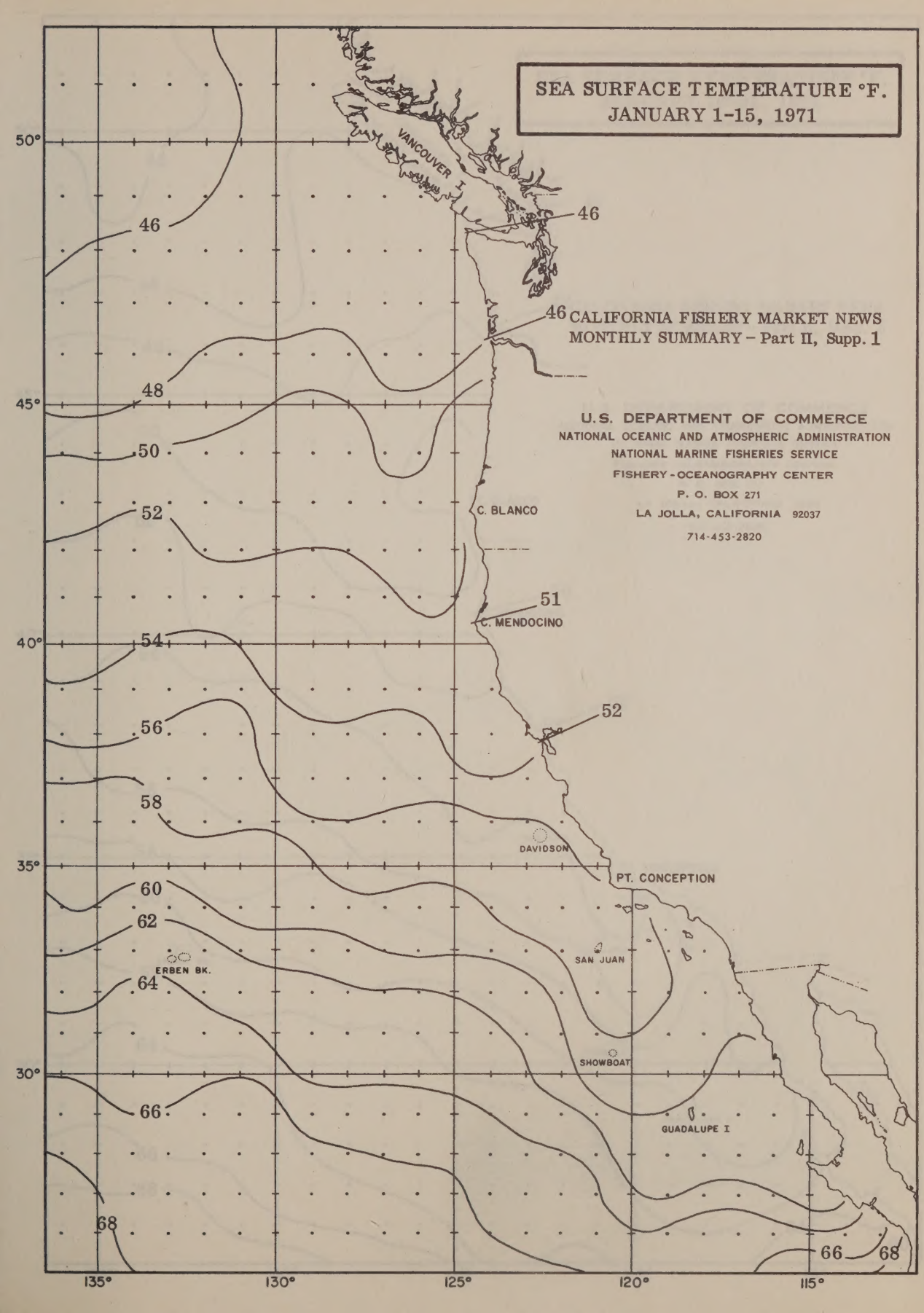

JANUARY 1-31, 1971
FIG.5-MEAN SEA SURFACE TEMPERATURE (°F.). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
HAWAIIAN ISLANDS
MARQUESAS
TUAMOTU ARCHIPELAGO
SAMOA ISLANDS
COOK ISLANDS
TONGA ISLANDS
PHOENIX ISLANDS
LINE ISLANDS
Honolulu
Acapulco
Panama
Guayaquil
Lima
San Francisco
Tahiti
Rarotonga
KERMADEC IS.

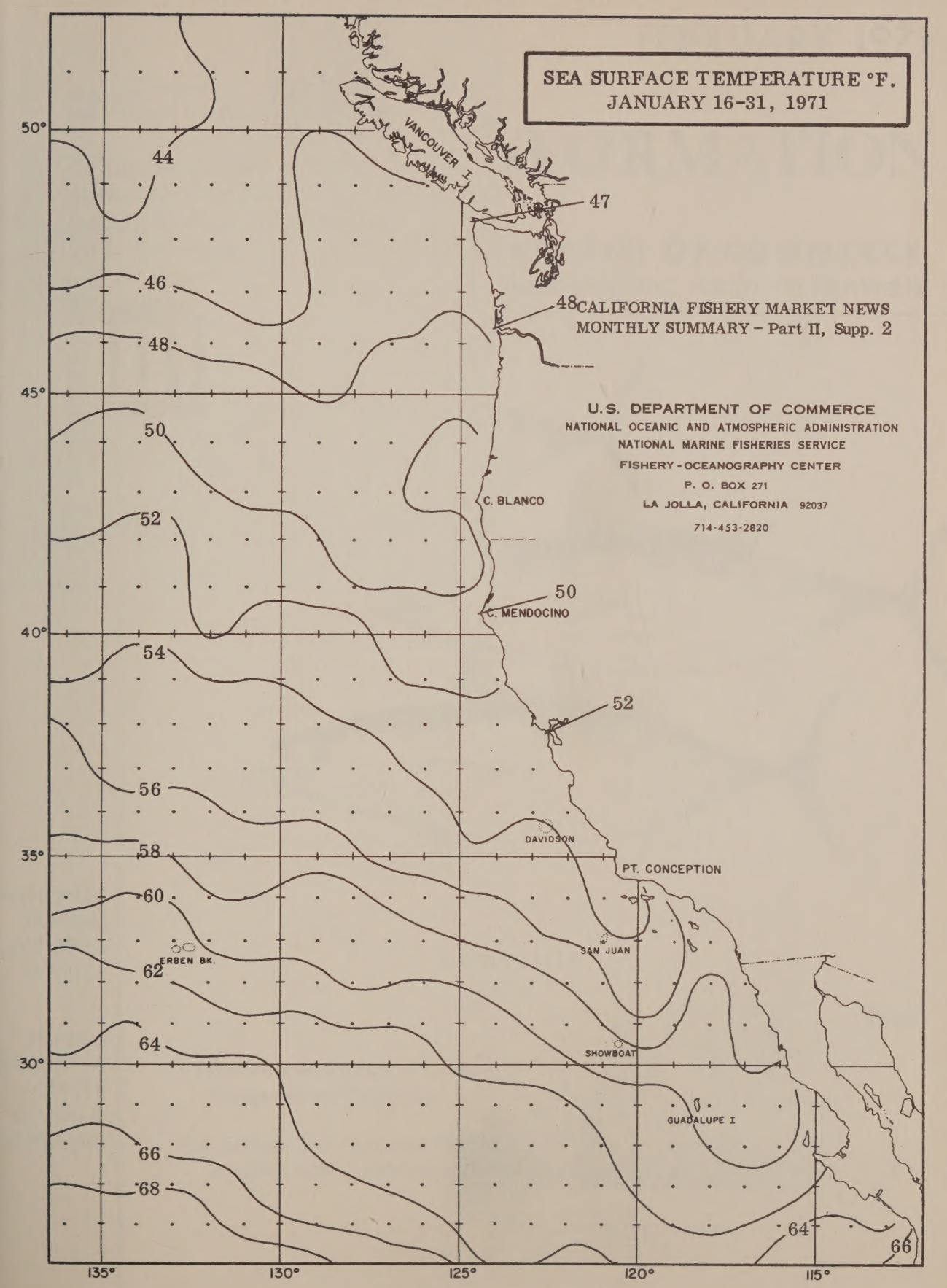

JANUARY 1-31, 1971
FIG.6-DEVIATION OF SEA SURFACE TEMP. (°F.) FROM LONG TERM MEAN. SHADED AREAS COLDER IN 1971.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GULF OF CAMPECHE
YUCATAN
Guaymas
Mazatlan
San Blas
Acapulco
Salina Cruz
Panama
Guayaquil
Lima
Callao
Trujillo
Salaverry
Paita
Talara
Tumaco
Buenaventura
Manzanillo
Puerto Vallarta
Zihuatanejo
Tuxpan
Veracruz
Coatzacoalos
Progreso
Cuba
Jamaica
Haiti
Puerto Rico
Curacao
Aruba
Barranquilla
Cartagena
Maracaibo
Caracas
Trinidad
Barbados
Martinique
Guadeloupe
Dominica
Antigua
Virgin Islands
Bermuda
Galveston
Tampico
Veracruz
Coatzacoalcos
Progreso
Belize
Honduras
Nicaragua
Costa Rica
Panama
Colombia
Ecuador
Peru
Chile
Galapagos Is.
Marquesas Is.
Tuamotu Archipelago
Society Is.
Samoa Islands
Union Islands
Phoenix Islands
Tonga Islands
Cook Islands
Tubuai Is.
Austral Is.
Easter Is.
Kermadec Is.
Juan Fernandez Is.
Mas Afuera
Mas Atierra
Malpelo I.
Cocos I.
Clipperton I.
Revilla Gigedo Is.
Socorro I.
Roca Partida
Isla Isabel
Islas Marias
Islas Tres Marias
Islas Revillagigedo
Islas Galapagos
Islas Marquesas
Islas Tuamotu
Islas Sociedad
Islas Samoa
Islas Union
Islas Fenix
Islas Tonga
Islas Cook
Islas Tubuai
Islas Australes
Islas Pascua
Islas Kermadec
Islas Juan Fernandez
Islas Mas Afuera
Islas Mas Atierra
Islas Malpelo
Islas Cocos
Islas Clipperton
Islas Revillagigedo
Islas Socorro
Islas Roca Partida
Islas Isabel
Islas Marias
Islas Tres Marias


JANUARY 1-31, 1971
FIG.7-DEVIATION OF SEA SURFACE TEMP. (°F.) FROM JANUARY 1970. SHADED AREAS COLDER IN 1971.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GULF OF CAMPECHE
YUCATAN
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
COLOMBIA
Guayaquil
Manzanillo
Acapulco
Salina Cruz
Tampico
San Jose
Corrientes
Guaymas
Alamos
Mazatlan
Cabo San Lucas
Revilla Gigedo Is.
Galapagos Is.
Cocos Is.
MARQUESAS
ORION ISLANDS
SAMOA ISLANDS
TONGA ISLANDS
COOK ISLANDS
TUAMOTU ARCHIPELAGO
TUBUAI OR AUSTRAL Is.
BERMADEC IS.
Salas y Gomez
Juan Fernandez Is.
Easter Is.
Mocha I.
Valdivia
Arica
Iquique
Callao
Paita
Tumbes
Esmeraldas
San Francisco
Buenaventura
Tumaco
Malpelo I.
Cocos I.
Gorgona I.
Gorgonilla I.
Pinas
Puerto Armuelles
Bahia Honda
Bahia Piedras
Bahia Pinas
Bahia Parita
Bahia Montijo
Bahia Honda
Bahia Rio Hato
Bahia Mala
Bahia Chame
Bahia Panama
Bahia Perlas
Bahia Piedras
Bahia Pinas
Bahia Parita
Bahia Montijo
Bahia Honda
Bahia Rio Hato
Bahia Mala
Bahia Chame
Bahia Panama
Bahia Perlas


JANUARY 1961–1971
FIG. 8–OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


JANUARY 1971
FIG. 9-OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1008
1004
1000
1012
1016
1020
1024
1012
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


SEA SURFACE TEMPERATURE °F.
JANUARY 1-15, 1971
CALIFORNIA FISHERY MARKET NEWS
MONTHLY SUMMARY – Part II, Supp. 1
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
FISHERY-OCEANOGRAPHY CENTER
P. O. BOX 271
LA JOLLA, CALIFORNIA 92037
714-453-2820
VANCOUVER I.
C. BLANCO
C. MENDOCINO
DAVIDSON
PT. CONCEPTION
SAN JUAN
SHOWBOAT
GUADALUPE I
ERBEN BK.
46
48
50
52
54
56
58
60
62
64
66
68
51
50°
45°
40°
35°
30°
135°
130°
125°
120°
115°


SEA SURFACE TEMPERATURE °F.
JANUARY 16-31, 1971
CALIFORNIA FISHERY MARKET NEWS
MONTHLY SUMMARY – Part II, Supp. 2
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
FISHERY-OCEANOGRAPHY CENTER
P. O. BOX 271
LA JOLLA, CALIFORNIA 92037
714-453-2820
VANCOUVER I.
C. BLANCO
C. MENDOCINO
DAVIDSON
PT. CONCEPTION
SAN JUAN
SHOWBOAT
GUADALUPE I
ERBEN BK.
44
46
47
48
50
52
54
56
58
60
62
64
66
68
50°
45°
40°
35°
30°
135°
130°
125°
120°
115°